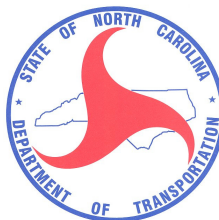


ANNUAL REPORT FOR 2015



UT to Falling Creek Wetland Mitigation Site
Lenoir County
TIP No. R-2719A
COE Action ID: 200802460
DWR: 003763



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SUMMARY

The following report summarizes the wetland monitoring activities conducted during 2015 at the UT to Falling Creek Mitigation Site. This site, situated adjacent to the new US 70 Bypass near Kinston, was designed and constructed during 2011 by the North Carolina Department of Transportation (NCDOT) in order to provide mitigation for wetland impacts associated with the construction of Transportation Improvement Program (TIP) number R-2719A. This report provides the monitoring results for the third formal year of monitoring (Year 2015). The site must demonstrate hydrologic and vegetation success for a minimum of five years or until the site is deemed successful.

The site hydrology is monitored with two groundwater gauges and one surface water gauge. Both of the groundwater gauges met the jurisdictional criteria for wetland hydrology (>12.5% of the growing season) in 2015. A surface water gauge was installed in 2011 to record stream flow. Based on the streams design parameters, data indicates that numerous bankfull events occurred during the 2015 monitoring period (see stream data graph in Appendix A).

Two vegetation plots were established to monitor the trees planted in the 3.90 acre restoration site. The 2015 vegetation monitoring revealed an average density of 516 trees per acre, which is well above the minimum success criteria of 290 trees per acre.

NCDOT will continue hydrologic and vegetation monitoring at the UT to Falling Creek Mitigation site in 2016.

1.0 INTRODUCTION

1.1 Project Description

The following report summarizes the wetland monitoring activities that have occurred during 2015 at the UT to Falling Creek Mitigation Site. The site is located adjacent to US 70 Bypass near Kinston (Figure 1). The site was constructed to provide mitigation for wetland impacts associated with R-2719A in Lenoir County. The site provides 3.90 acres of riverine wetland restoration assets which if approved, will be used to offset future wetland impacts.

1.2 Purpose

In order to demonstrate successful mitigation, hydrologic and vegetative monitoring must be conducted for a minimum of five years or until success criteria are satisfied. Success criteria are based on federal guidelines for wetland mitigation. Criteria for hydrologic conditions and vegetation survival are included in these documents. The following report details the results of hydrologic and vegetation monitoring during the 2015-growing season at the UT to Falling Creek Mitigation Site.

1.3 Project History

February 2011	Site Constructed
March 2011	Site Planted
April 2011	Hydrologic Gauges Installed
August 2012	Vegetation Monitoring (Year 1)
March-November 2013	Hydrologic Monitoring (Year 1)
July 2013	Vegetation Monitoring (Year 2)
March-November 2014	Hydrologic Monitoring (Year 2)
June 2014	Vegetation Monitoring (Year 3)
March-November 2015	Hydrologic Monitoring (Year 3)
June 2015	Vegetation Monitoring (Year 4)

1.4 Debit Ledger

Table 1. UT to Falling Creek Debit Ledger

Site name	Site TIP	HUC	River Basin	Division	County	Mitigation Type	Notes	As Built Quantity	Available	Debit
UT to Falling Creek	R-2719A	03020202	Neuse	2	Lenoir					R-2719A
						Riverine Restoration		3.90	3.90	*
						Stream Restoration		2,393 lf	316 lf	2,077

Note: Debit ledger information up to date as of January 5th, 2015.

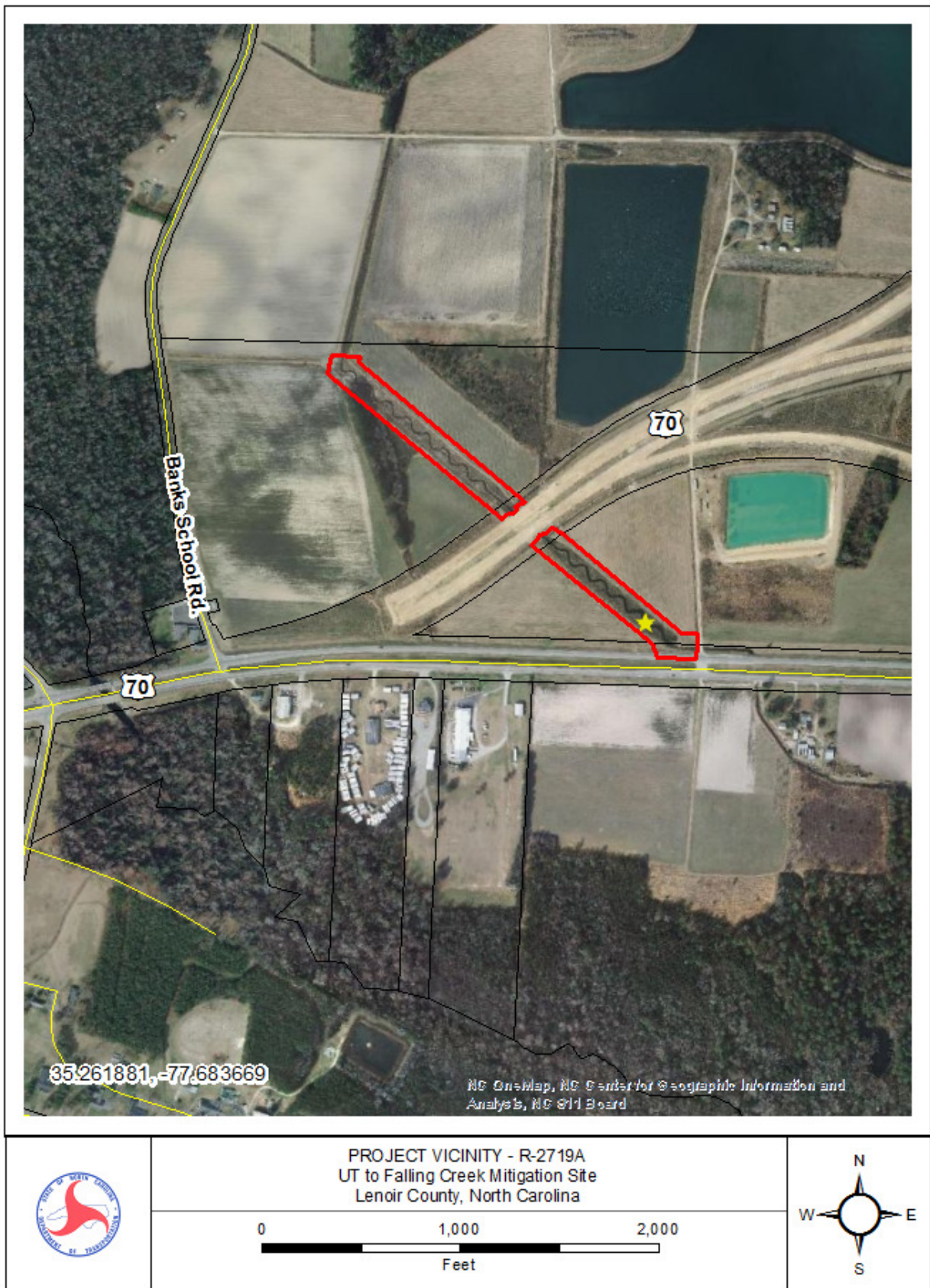


Figure 1. Site Location Map

2.0 HYDROLOGY

2.1 Success Criteria

In accordance with the mitigation plan and permit for wetland mitigation, the success criteria for hydrology states that the area must be inundated or saturated (within 12" of the surface) by surface or ground water for at least a consecutive 12.5% of the growing season. Areas inundated less than 5% of the growing season are classified as non-wetlands. Areas inundated between 5% and 12.5% of the growing season can be classified as wetland depending upon factors such as the presence of hydrophytic vegetation and hydric soils.

The growing season in Lenoir County begins March 17 and ends November 15. These dates correspond to a 50% probability that temperatures will remain above 28° F or higher after March 17 and before November 15. The growing season is 244 days; therefore hydrology for 12.5% of the growing season is at least 31 consecutive days, while 8.0% would be equivalent to 19 days. Local climate must represent average conditions for the area in order for the hydrologic data to be valid.

2.2 Hydrologic Description

Two groundwater monitoring gauges and one surface water gauge are used to record site hydrologic data. The groundwater gauges are set to record daily water levels while the surface water gauge is set to record at 4-hour intervals. The hydrologic response (groundwater) to rainfall events is evaluated using data provided by the North Carolina State Climate Office.

Appendix A contains a plot of the water depth for each of the groundwater and surface water monitoring gauges for 2015. Precipitation events, provided by the State Climate Office, are included on each groundwater graph as bars.

2.3 Results of Hydrologic Monitoring

2.3.1 Site Data

The total number of consecutive days that the groundwater was within twelve inches of the surface was determined for each groundwater monitoring gauge. This number was converted into a percentage of the growing season. Table 1 presents the hydrologic results for 2015. Figures 2 and 3 are a graphical representation of the hydrologic monitoring results for 2015.

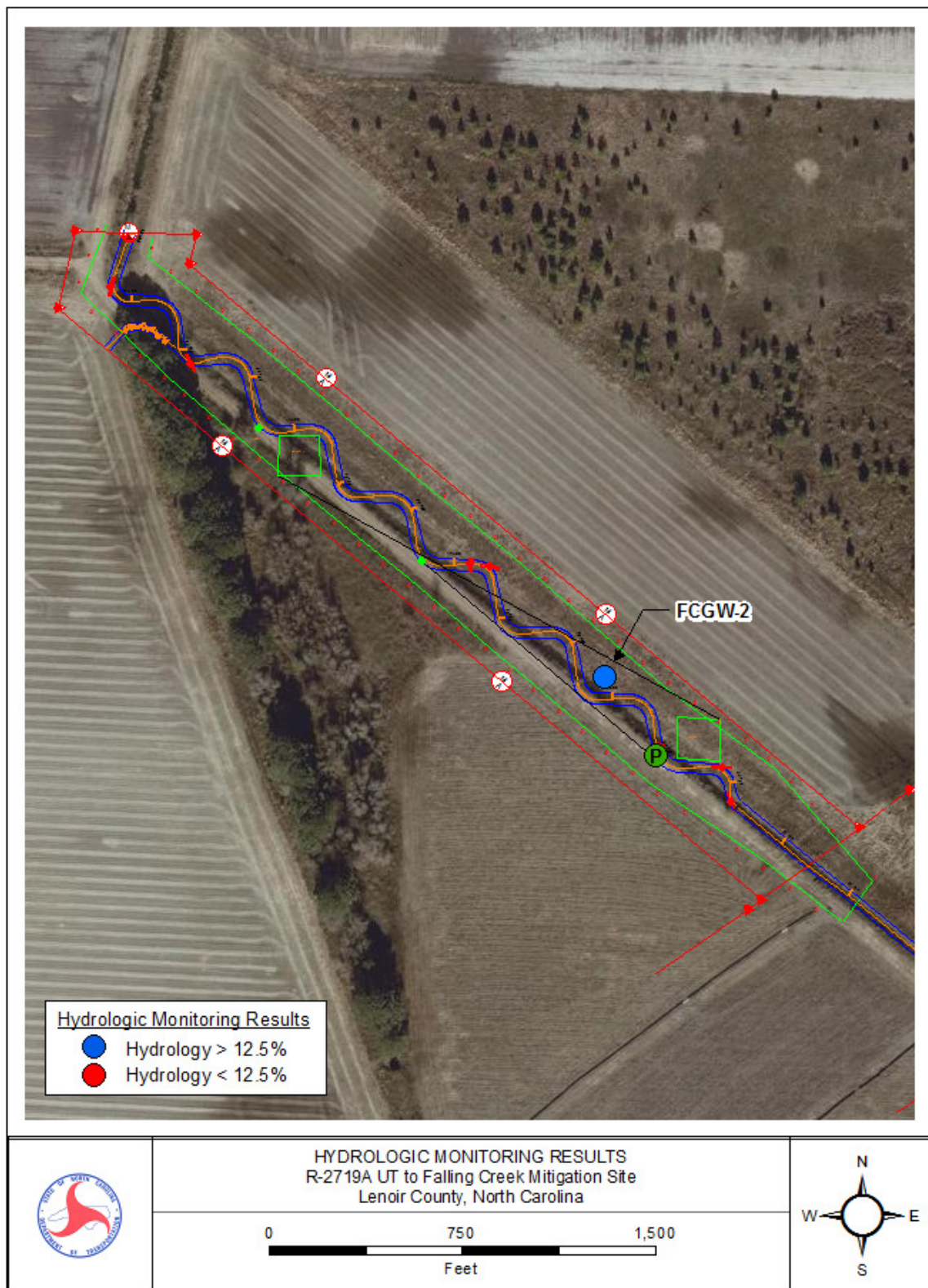


Figure 2. 2015 Hydrologic Monitoring Results

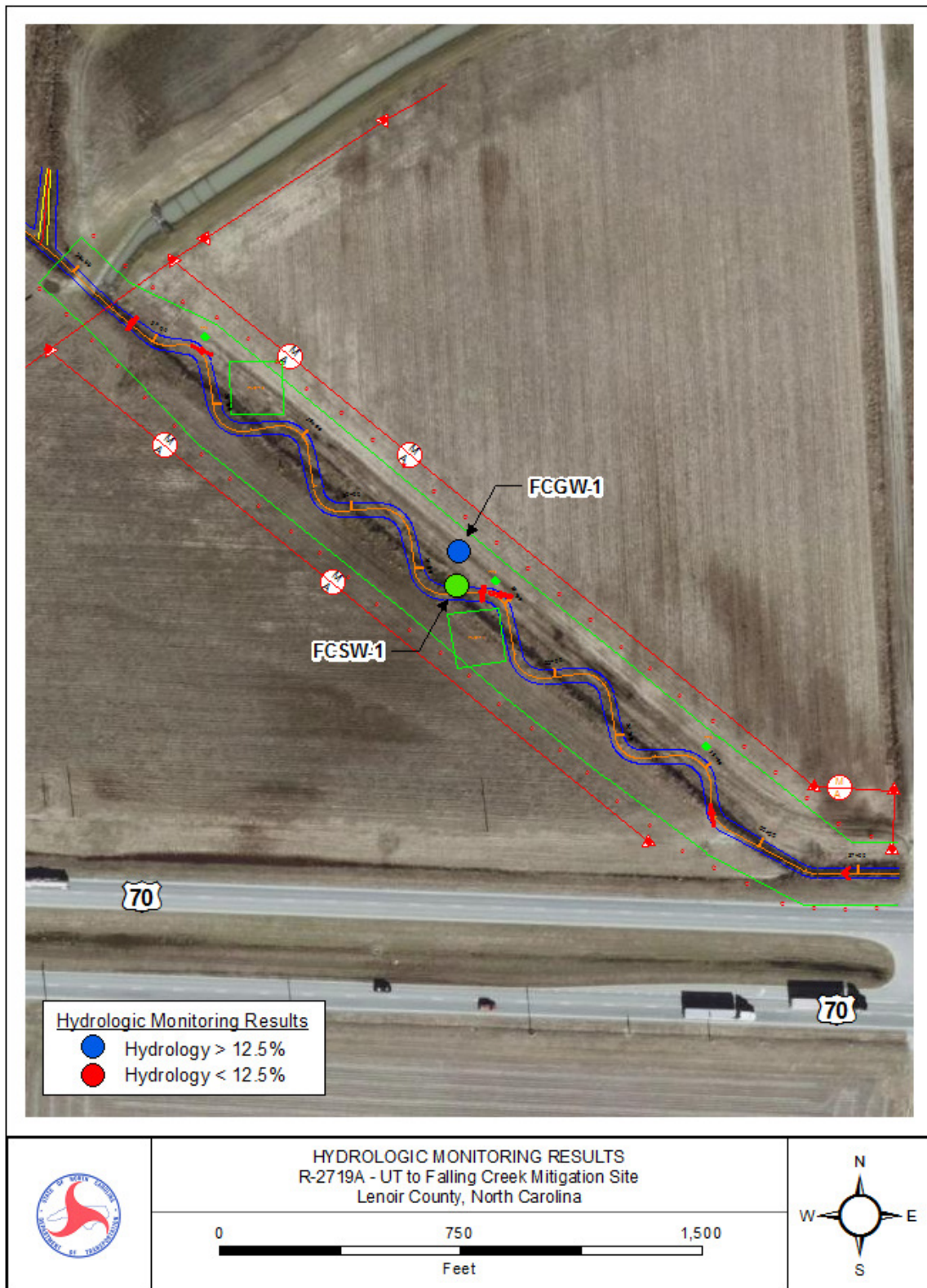


Figure 3. 2015 Hydrologic Monitoring Results

Table 2. 2015 Hydrologic Monitoring Results

Monitoring Gauge	< 5%	5-12.5%	> 12.5%	Actual %	Dates of Success
FCGW-1			X	100.0	Mar 17-Nov 15
FCGW-2			X	100.0	Mar 17-Nov 15

*Appendix A contains plots of surface and groundwater data during 2015.

Table 3. 2013-2017 Hydrologic Monitoring Results

Monitoring Gauge	2013 Results	2014 Results	2015 Results	2016 Results	2017 Results
FCGW-1	100.0	100.0	100.0		
FCGW-2	100.0	100.0	100.0		
Climate Conditions	Avg./Above Average Rainfall	Avg./Above Average Rainfall	Avg./Above Average Rainfall		

2.3.2 Climatic Data

Figure 4 is a comparison of monthly rainfall for the period of January 2015 through November 2015 to historical precipitation (collected between 1983 and 2012) for Kinston Agriculture Research Station in Lenoir County. This comparison gives an indication of how 2015 relates to historical data in terms of climate conditions. The NC State Climate Office provided all local rainfall information.

For the 2015-year, March, April, June, and September experienced average rainfall. August recorded below average rainfall while January, February, May, July, October, and November recorded above average rainfall. Overall 2015 experienced an average to above average rainfall year.

2.4 Conclusions

The 2015 year represents the third year that hydrologic data has been collected on the UT to Falling Creek Mitigation Site. Both of the groundwater monitoring gauges met the jurisdictional criteria wetland hydrology (>12.5% of the growing season), while the surface water gauge recorded numerous bankfull events.

NCDOT will continue to monitor the hydrology at the UT to Falling Creek Mitigation Site in 2016.

**UT to Falling Creek 30-70 Graph
Kinston, NC Monthly Precipitation**

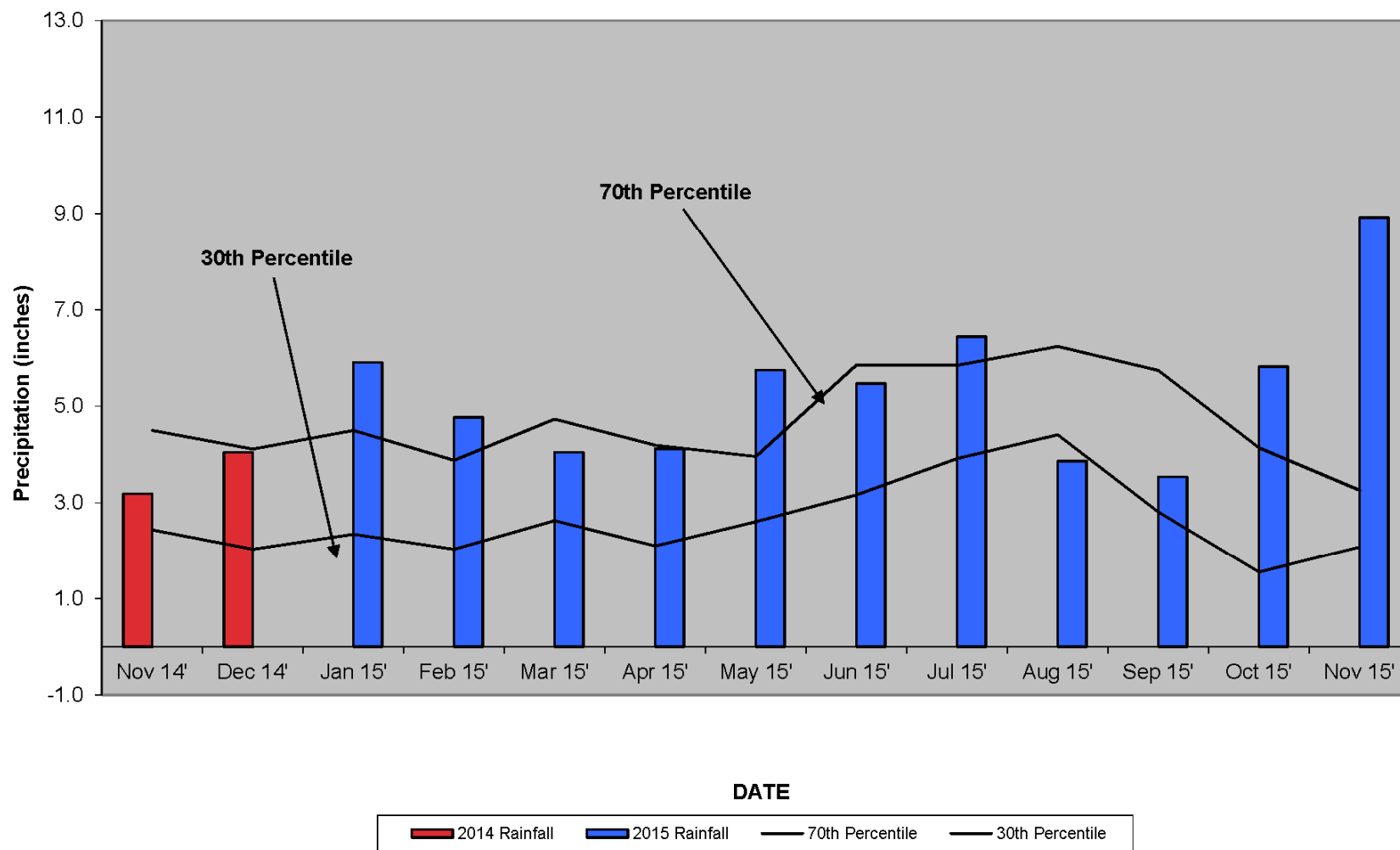


Figure 4. 30-70 Percentile Graph 2015

3.0 VEGETATION: UT TO FALLING CREEK MITIGATION SITE (YEAR 4 MONITORING)

3.1 Success Criteria

The success criteria states that there must be a minimum of 320 tree per acre living for at least three year consecutive years. A minimum of 290 trees per acre must be living at year four and a minimum of 260 trees per acre must be living at year five.

3.2 Description of Species

The following tree species were planted in the Riverine Wetland Area:

Sambucus canadensis, American Elderberry

Cornus amomum, Silky Dogwood

Betula nigra, River Birch

Fraxinus pennsylvanica, Green Ash

Quercus michauxii, Swamp Chestnut Oak

Quercus lyrata, Overcup Oak

3.3 Results of Vegetation Monitoring

Table 4. Vegetation Monitoring Statistics

Plot #	River Birch	Green Ash	Overcup Oak	Swamp Chestnut Oak	Baldcypress	Total (Year 4)	Total (at planting)	Density (Tree/Acre)
1	21	5	3		2	31	37	570
2	15	6	3	1	2	27	41	448
3	4	20	4	1	3	32	41	531
4	15	9	11		3	38	50	517
Year 4 Average Density								516
Year 3 Average Density								498
Year 2 Average Density								537
Year 1 Average Density								625

Site Notes: Other species noted: soft rush, red maple, broomsedge, pine, baccharis, cattail, woolgrass, morning glory, *Scirpus* sp., sweetgum, briars, tear-thumb, wax myrtle, lespedeza, and various grasses.

3.4 Conclusions

Approximately 3.90 acres of this site were planted in March 2011. There were four vegetation monitoring plots established throughout the riverine wetland area. The 2015 vegetation monitoring revealed an average density of 516 trees per acre, which is above the minimum success criteria of 290 trees per acre.

NCDOT will continue to monitor the vegetation at UT to Falling Creek Mitigation Site in 2016.

4.0 OVERALL CONCLUSIONS/ RECOMMENDATIONS

The 2015 year represents the third monitoring year that hydrologic data has been collected on the UT to Falling Creek Mitigation Site. Both of the groundwater monitoring gauges met the jurisdictional criteria for wetland hydrology (>12.5% of the growing season), while the surface water gauge recorded numerous bankfull events.

There were two vegetation monitoring plots established throughout the riverine wetland area. The 2015 vegetation monitoring revealed an average density of 516 trees per acre, which is well above the minimum success criteria of 290 trees per acre for the fourth year of monitoring.

NCDOT will continue hydrologic and vegetation monitoring at the UT to Falling Creek Mitigation Site in 2016.

APPENDIX A

GROUNDWATER AND SURFACE WATER

GAUGE DATA GRAPHS

APPENDIX B

SITE PHOTOS AND PHOTO AND VEGETATION PLOT

LOCATIONS MAP

UT to Falling Creek



Photo Point #1 (Upstream)



Photo Point #1 (Downstream)



Photo Point #2 (Upstream)



Photo Point #2 (Downstream)



Photo Point #3 (Upstream)



Photo Point #3 (Downstream)

UT to Falling Creek



Photo Point #4 (Upstream)



Photo Point #4 (Downstream)



Photo Point #5 (Upstream)



Photo Point #5 (Downstream)



Photo Point #6 (Upstream)



Photo Point #6 (Downstream)

UT to Falling Creek



Overview photo looking upstream



Overview photo looking downstream



Photo of Vegetation Plot #1



Photo of Vegetation Plot #2



Photo of Vegetation Plot #3

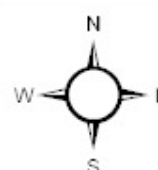
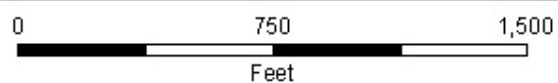


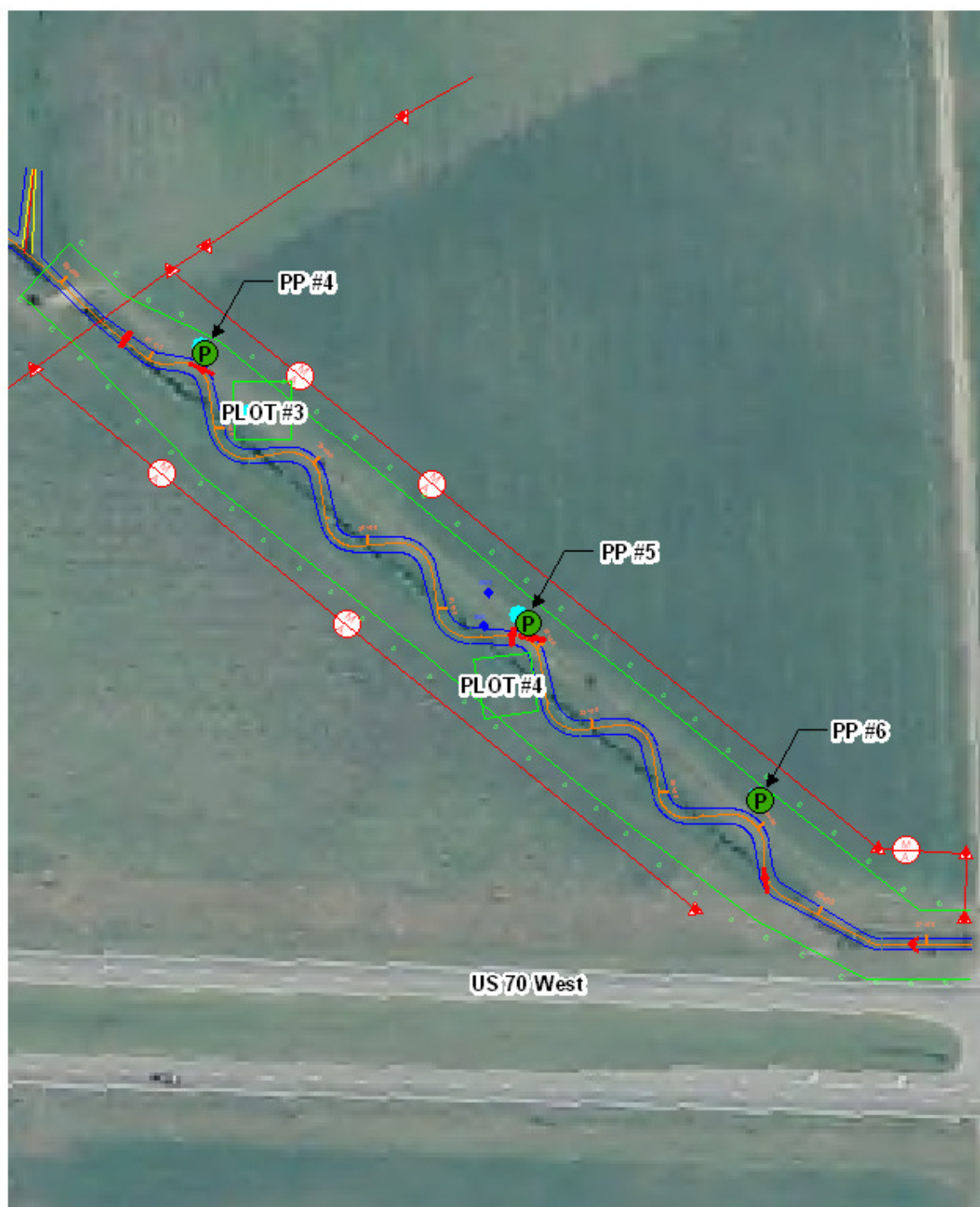
Photo of Vegetation Plot #4

Year 4 Summer – June 2015



R-2719A UT to Falling Creek Stream Restoration Site
Vegetation Plot & Photo Point Locations
Lenoir County, North Carolina





R-2719A UT to Falling Creek Stream Restoration Site
Vegetation Plot & Photo Point Locations
Lenoir County, North Carolina

